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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 70

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CONTENTS

BRIEFS

ECUADOREAN-SPANISH NUCLEAR RESEARCH--Ecuador and Spain have ratified their agreement to continue with the project of building a research reactor of 30,000 watts in the nuclear studies center. The International Atomic Energy Agency [IAEA] has offered to help Ecuador carry out various projects on radiation technology, a dosimetry laboratory and uranium prospecting. General Osvaldo Suarez Rueda, chairman of the Ecuadorean Atomic Energy Commission, reported on this after attending the 24th assembly of the IAEA in Vienna and after visiting the installation of the Spanish Energy Board in Madrid. [PA130038 Quito Voz De Loz Andes in Spanish 1730 GMT 8 Oct 80 PA]

CSO: 5100

GANDHI TELLS HOUSE OF NUCLEAR POWER PLANS

New Delhi PATRIOT in English 7 Aug 80 p 5

[Excerpt] India is expected to achieve nuclear power generation capacity of 860 megawatts by 1980-81 Prime Minister Indira Gandhi said in the Lok Sabha on Wednesday, reports PTI.

In a written reply to Mr George Fernandes, Mrs Gandhi said the target contemplated by the Atomic Energy Commission envisaged a nuclear power generation capacity of 8000 megawatts by 1980-81.

But a task force of the Department of Atomic Energy in 1973 recommended that the nuclear power generation capacity by that year be fixed at 1240 megawatts considering the difficulties encountered in achieving the desired results.

The main reasons given by Mrs Gandhi for non-fulfillment of the targets originally envisaged, are the inability of the industrial infrastructure to cope with any faster programme, inadequacy of the transportation system for handling large and heavy pieces of equipment, need to redesign the reactor units to make them more efficient and economical and to adapt them to suit the capabilities of Indian manufacturers.

Mrs Gandhi explained that Rajasthan Atomic Power Station unit one had been in commercial operation since December 1972. The second unit was expected to be commissioned some time this year.

Mrs Gandhi said the power produced by the Kota Atomic Power Station was fed into the Rajasthan power grid and no separate account was kept of the use of power supplied by it.

Mrs Gandhi said the radio activity released by nuclear power plants in India did not pose any health hazard to the people in the neighbourhood.

CSO: 5100

DANGERS OF NUCLEAR POWER DEVELOPMENT STRESSED

Bombay THE TIMES OF INDIA in English 21, 22 Aug 80

[Part I of two-part article by Dhirendra Sharma: "Time To Move Away From Nuclear Power"]

[Text]

NUCLEAR power, if properly computed, without its defence and military pay-off, costs more than any conventional source of electricity. Nuclear technology is not only capital-intensive but also energy-intensive. Tarapur station, for example, with a total installed capacity of 200 MWe per unit, consumes about 30 MWe electricity per unit before it can give out any power to the Maharashtra-Gujarat grid. It requires special safety systems, thousands of electric and electronic inputs and, above all, frequent shutdowns for refuelling and periodic check-ups. Its fuel preparation requires special mining, processing, re-processing and fabrication of fuel facilities and special shipment and transportation arrangements. Most importantly, construction and maintenance of major nuclear facilities depend upon external inputs.

In a third-world country where the industrial base is not strong enough to back up such a non-economical technology, the gestation period is unpredictably long. Contrary to what the Department of Atomic Energy claims, our foreign dependency is as high as 40 to 50 per cent. Most Indian nuclear projects, following the end of foreign co-operation in 1974, have been delayed for 15 to 20 years. This has caused uncertainty in our national industrial growth and development. Nuclear enthusiasts conveniently ignore such hidden costs of nuclear power generation.

There is no nuclear plant competitive with a conventional power plant anywhere in the world. On a factual basis, nuclear competitiveness cannot be said to be firmly established.

Heavy water costly

As a salesman of nuclear technology, Dr. H. J. Bhabha in 1950 overstated the case for it by saying that atomic power was competitive with other commercial sources of electricity. Those who think like him now repeat the same argument without accounting for the changes that have taken place since on the national and international scenes. Heavy-water, for example, is not available today, but, if available, it would cost about Rs. 60 crores per reactor unit initially and the annual replenishment would be about Rs. 3 to Rs. 4 crores per unit, depending on how efficiently you run the reactor.

The DAE, after about two unsuccessful decades at work, has now turned into "the department of added estimates". According to its 1980-81 budget, the revised and re-revised estimates of costs of all its nuclear projects have risen as much as by 80 per cent from their original estimates.

Recently, the DAE, in an "ambitious blueprint", has asked for Rs. 2,700 crores as "seed" money for the next five years to carry out a 20-year nuclear strategy. Its performance does not tally with its promises. If the government now agrees to its budgetary demands, it would lead to further deterioration in the DAE's performance. Like a spoiled child, it would only add to its indulgence and non-responsiveness to national demands.

Dr. Vikram Sarabhai in his "Profile for the decade 1970-80 of Atomic Energy in India", had promised an installed capacity of 2,700 MWe. in 1980. But, since his untimely death in 1971, Dr. Sarabhai's profile remains a forgotten document in the files of the DAE. A more recent

statement, "The Performance Budget 1977-78," was more modest, aiming only at 800 MWe installed capacity, which the DAE was unable to achieve. It has not been able to run its existing turnkey nuclear reactors, whose total electrical capacity is just about 580 MWe (Tarapur 380 and Rajasthan Unit 1 200 MWe), efficiently to a normal 75 per cent factor.

It is, however, true that the political fallout of the Pokharan explosion in 1974 adversely affected our nuclear programme when all external cooperation was abruptly snapped. Under the rules of the so-called "London Club," an embargo has been imposed on all essential supply of nuclear material to India by the nuclear-industrial nations, including the USSR. India is barred from importing heavy-water, uranium fuel, standard heavy metal, hardware, reactor components, electronic inputs and spares. Such restrictions have brought our nuclear projects to a grinding halt--a fact which has not been fully disclosed to the nation.

Plans Unrealistic

Recent announcements in the Lok Sabha (July 31) indicate that the government has approved the DAE's "ambitious" plans which are totally unrealistic. For even if India can, within four to five years, produce all its heavy-water requirement--300 to 400 tonnes--mere heavy water is not sufficient to run nuclear reactors. With the present facilities at our disposal, we cannot meet the uranium fuel demands for the six already planned power projects for 1985. Our planned projects are based on the Canadian concept of CANDU reactors which use natural uranium and heavy water as coolant. For each CANDU of about 235 MWe capacity, about 80 tonnes of natural uranium fuel is required per unit per year. That amounts to 480 tonnes of uranium for the reactors that have been on assembly lines for the last eight to ten years.

Once a nuclear reactor has been commissioned, it cannot be simply shut down for want of fuel. A minimum of five years of forward fuel reserves must exist before construction begins. But the lead time for the conversion of potential resources to reserve range is from three to four years in a country where little direct geological evidence of minerals is available. The DAE may have some hypothetical resources, but no availability projection can be made for securing uranium fuel where there is absolutely no evidence in hand.

The lead time for mining and the fabrication of nuclear fuel facility construction is currently estimated to be roughly 3 to 5 years or more and is expected to increase further due to new demands for much larger mills and greater depths for underground mines. Frequent power breakdowns in the country and labour unrest will also add to the lead time in building up the necessary uranium fuel reserves. At today's level of experienced skilled geological manpower, drill rigs and gamma-ray logging units available within the country, the fuel demands of nuclear reactors cannot be met indigenously. And judging by the DAE's past performance as well as by its claims regarding the existing capacity of our uranium mines and milling facilities, there is little hope that, given a second chance, it can fulfill its promise to the nation.

[22 Aug 80, p 6]

[Text]

THE scientists and engineers at our major nuclear facilities and at the Bhabha Atomic Research Centre have been frustrated due to lack of a new challenge and initiative. They lack freedom to interact with their peers at universities and other institutions. There is suffocation and a sense of dejection among our nuclear scientists. The DAE is infested with favouritism, corruption and inefficiency. In the name of secrecy and discipline, scientific workers are not permitted to voice dissent and criticism. The present set-up is not fit for programmatic responsibility and should be reappraised by an independent body. The AEC, too, should be encouraged to clean up its old cobwebs.

After 30 years of experience with nuclear power generation, serious doubts have risen in the West, causing a recession in the nuclear industry since 1974. Nuclear utilities are finding it difficult to raise money for new plants. Sweden has adopted a new policy which will phase out its 12 reactors by 2010. In the US, nearly 300 nuclear utilities have cut their construction budget of about 40 billion dollars reducing its target of power generation capacity by 220,000 MWe. The US Energy Research and Development Administration (ERDA) has downgraded its estimated 1,200 nuclear plants of 1,000 MWe capacity each by about 400 plants for the year 2000. But in India, the attraction for nuclear technology is still strong and, following our example, Pakistan, Libya and Brazil are trying hard to acquire nuclear prestige through a Pokharan-type explosion.

There may be some truth in the assumption that technologically advanced nations do not wish to see India go nuclear just as we do not want to see Pakistan go nuclear. But we must be cautious about such generalisations. The Western economy cannot sit idle for long and, since the trillion dollars worth nuclear industry is near a standstill in most Western countries, they must be anxious to sell their hardware to nuclear power-hungry third world governments. But it is interesting to note that to avoid retrenchment of their scientists and engineers, the U.S. government and the U.S. department of defence have allocated more than a billion dollars to various agencies and institutions to come up with competitive renewable solar energy alternatives by 1985.

Obsolete concept

The concept of nuclear weapons has become obsolete. They cannot be used in self-defence and have only a deterrent value. Nor can they be dismantled without creating environmental hazards. The next war is not likely to be conducted with nuclear weapons. Solar energy weapons will have an advantage over nuclear warheads. For if they are destroyed while sitting on their own bases, they will cause no damage to the home country. India, by going in for solar energy R & D, can leapfrog this stage and enter directly into the next generation of weapons technology.

A 12,000-strong force of [illegible]working scientists and engineers at the BARC is idle since 1974, as if they too have reached a dead-end in nuclear development. The expertise at the BARC can be diverted to solar energy R & D which can also have a military potential.

The problem of energy for India is not the same as in the United States where 60 per cent of commercial energy is consumed in heating and industry. Here, an equivalent of 144 million tonnes of coal is consumed as non-commercial fuel, mostly in domestic cooking. Wind, water and sun energy is used in agriculture as a renewable source. In mountainous regions, flour mills are run on water-force (*pan-chakkies*) and drying and winnowing of paddy and wheat is done by sun and wind power.

Every monsoon, thousands of our towns and villages are devastated by floods in which lies trapped enormous hydel power which can be harnessed for the country's advantage. At present, less than 20 per cent of our hydel capacity is utilised to the extent of 53 per cent. In addition, 18 per cent of power is lost in transmission due to inefficient management. Hydel power is renewable, clean and totally self-reliant requiring no external dependency. And yet, in comparison with nuclear power, the official encouragement to improve hydel efficiency and exploitation is very small. Because the most powerful lobby in the country belongs to the nuclear sector, our policy-makers have not paid the necessary attention to these alternatives.

Solar energy

In the early fifties, one of the Council of Scientific and Industrial Research laboratories took up a solar energy project. But it was hastily abandoned after unfavourable criticism and pressures from bureaucrats, politicians and scientists. Now, our revived interest in solar technology, nearly a quarter of a century later, leaves us behind other nations. France, for instance, also began to tap solar energy immediately after the second world war and the U.S. department of energy is today keen to obtain French technology to assist the American R & D efforts in the field.

Thirty years ago, when Dr. Bhabha and Mr. Nehru were enthusiastic about nuclear power, it was believed that technical solutions to problems of reactor safety and radioactive waste disposals would be found. Today, these solutions remain elusive despite millions of dollars spent on research. It is for this reason that the worldwide opposition to nuclear power has now acquired a formidable momentum. Consequently, nuclear commercial activity is at a near standstill in the U.S. In contrast, solar energy is the cleanest, safest and environmentally most gentle source of electricity.

The arguments against nuclear technology are too well-established to be rejected as simply "anti-science". What has actually happened since the days of Dr. Bhabha is that the nuclear paradigm has been falsified in face of the solar energy paradigm. This must be recognised by Indian policy-makers. Little debate has been permitted on the advantages and disadvantages of this self-devouring, fast-breeding technology. This is not the area where we should attempt to compete with other advanced nations. Undue publicity and the glamour attached to the "Big Bang" have greatly distorted our national perception of nuclear reality. Otherwise, our past experience tells us that every million earmarked now for the nuclear programme will simply drag us into a quagmire of many more millions within two or three years. It is imperative that we consider the economic, industrial and ecological implications of our nuclear policy seriously and give the importance to renewable energy sources that they deserve.

There is a great danger of our energy policy becoming the captive of the nuclear-technological elite. Our national energy planning and our military and defence interests would be better served by developing solar technology.

CSO: 5100

CASE AGAINST NUCLEAR POWER FOR INDIA EXAMINED

Calcutta THE STATESMAN in English 9 Oct 80 p 8

[Article by B. P. Banerjee]

[Text] IN some recent articles on energy and power, the need for a cohesive and realistic energy policy seems to have been underplayed. Indeed, one may have even formed the impression that such a policy exists, and failure is in action and implementation. Also, that the development of nuclear power is an integral component of that policy. Some basic issues, therefore, need reiteration and elaboration.

There seems to be some misunderstanding on the meaning and content of an energy policy. Surely it does not consist in ad hoc expressions of good and unrealistic wishes, or desires. Besides, energy policies, their implementation and consequent budget allocations are mostly Government decisions. A conflict between policy and practice in such a situation is wholly imaginary. Extreme negligence of development of hydel power, a renewable energy source, and the meagre allocation of funds for capital investment in this field, is but a reflection of the lopsided attitude to energy development.

Our concept of an energy plan is far more cohesive and realistic. It should state, unambiguously, the specific objectives to be achieved, followed by a time-indexed programme of action which, at every stage, achieves an energy balance (between requirements and production) and yet consistently and progressively converges to the plan objectives. This will include all forms of energy requirements including agricultural inputs, inputs for petrochemical industries, non-commercial energy requirements and resources, etc.

This should also include policies on conservation. For instance, it is widely known that substantial economy in fuel consumption can be achieved in the transport sector by developing proper standards for engine smoke density, engine performance axle ratio, streamlining of vehicle body, proper preventive maintenance, maintenance of roads, etc.

What is equally important, it should be based on the peculiarities and features of the energy resources indigenously available, and if necessary, carry schemes of specific, well-directed research in that connexion. For instance, it should look at the high ash and sulphur content of Indian coal, look at its compatibility with the boilers, now indigenously produced, but with designs from the West, presumably to suit coal of lower ash content and, as necessary make modifications in the system, deliberately aiming at optimization of performance rather than maximization.

Similarly, it should programme specific research and development of fluidised bed combustion, etc. It should look at the availability of nuclear resources, the safety and cost of nuclear power generation, compare the same with alternative sources and thus lay down a well thought out programme of action.

We feel that no such energy plan exists. Unless special efforts are made, it may not be possible to draw up such a plan on the basis of currently available information and statistics. For instance, perhaps as much as half of the total energy consumed in our country comes from non-commercial sources, such as firewood, cowdung, vegetable waste, as also from mechanical energy derived from animal power and manpower.

On the quantum of these energy inputs, we do not even have an estimate. Yet looking only at firewood, the percentage of forest area to the total land area, as also the per capita forest area in India is already much lower than the world average, and further denudation can only lead to serious ecological imbalance.

In view of the unusual importance given to it, it is necessary to explode some of the myths surrounding nuclear power. Of the 640 MW of nuclear energy capacity currently available, Tarapur accounts for 400 MW. Already, due to uncertain supply of enriched uranium from USA, the plant is running at less than full capacity. If enriched fuel does not become available and a viable alternative is not developed (and we have no evidence that it has been done), the plant will have to be shut down and yet considerable expenses will have to be incurred on it recurrently to prevent accident and radiation leakage.

In the natural uranium nuclear power stations in Rajasthan, Uttar Pradesh, Tamil Nadu, etc, moderated by heavy water, out of 120 kg of uranium loaded every year per MW of installed capacity, only about 2 kg will be actually consumed, producing 0.5 kg of plutonium. The rest of the uranium cannot be used as such and will be discharged out of the furnace together with the plutonium produced. One can well imagine the difficult problem that this huge waste would create about shielding against radiation leakage and/or over disposal.

The only way in which the plutonium, waste uranium, as also thorium available in plenty in our country, can be gainfully used as fuel for power generation is the use of fast breeder reactors (FBR). The technology for FBR is, however, yet to be developed and test-proved in our country. A hope has been expressed that we should be able to test-check the FBR technology by the last decade of this country. But, considering the actual achievement, it would be a wonder if this test-checking is possible before the end of the century.

Statistical evidence is almost invariably quoted in support of relative safety of nuclear power stations. But many reports on nuclear accidents are suppressed. The important point is that a nuclear accident either through melt-down or through radiation leakage from waste would not only affect the present but future generations as well. The chances of such accidents are not insignificant. The spent fuel remains dangerously radioactive and continues to emit heat over hundreds, even thousands, of years.

Reference is often made to the Rasmussen Safety Study (RSS), concluding that the fear of people concerning reactor accidents is ill-founded. But the special committee set up by the U.S. Nuclear Regulatory Commission (USNRC), announced on January 19, 1979, that it no longer stood by the interpretation of the results made by RSS. We often have a tendency to short-change future generations for the sake of temporary current gains. It is time to pause and think more carefully.

The difficult problem of waste disposal cannot be swept under the carpet, though we have been hearing for decades that safer techniques of waste disposal are being rapidly developed. The risk of accident is much higher in a fast breeder reactor. The FBR is usually fed with liquid sodium as coolant, which explodes immediately on coming in contact with water. The FBR also has a compact core, densely packed with fissile material. The high degree of heat that the core generates and the peculiar nature of the coolant increases the chance of core melt-down.

In explosion-prone activities, administration of inspection and safety is usually independent of production administration. But in the Indian atomic energy set-up, production, inspection and safety are under the same administrative control. In such a situation, in case of a conflict between production and safety, safety may not be the first consideration.

As for cost, it is claimed that with distances from the pit-head exceeding some 800 km., nuclear power proves cheaper than coal-based thermal power. It is important to be cautious about such cost comparisons. The following factors have to be kept in mind: (a) the R & D expenses on nuclear energy, which have to be amortised over the generated load in a reasonable manner; (b) the dismantling cost of the reactor and related structures at the end of its life, and the handling and disposal cost of the accumulated waste fuel and debris which is still highly radioactive; and (c) accounting for the cost of holding the nuclear waste and shielding it against leakage for a considerable time. The normal accounting procedure of discounting these costs to their present value is again a way of shortchanging future generations.

It is unwise to decide upon our energy policy, blindly on the basis of practice in other countries. Each country has its own peculiar energy resources and consequently possible energy balance. Its strategic options and compulsions may also be unique. For instance, France may have decided upon a fast expanding nuclear power programme to build up a stockpile of plutonium for nuclear explosion devices. Would India's compulsions be the same?

It needs hardly to be stressed that energy is a national issue, and policy recommendations on it should be the responsibility of experts cutting across political and ideological affiliations, carrying the confidence of the intelligent public across the board. Such an expert body, while giving due regard to strategic considerations, cannot afford to ignore the implications of cost and scarce financial resources. It has to ensure that the investment of our limited resources generates the maximum energy output. According to the Department of Atomic Energy, to install 10,140 MW of nuclear power by 2000 AD we would have to make an investment of Rs 2,100 crores during the first five years. (The requirements for the following 15 years have not yet been quantified.) One needs to do a comparative cost-benefit analysis to see how other energy routes compare in terms of investment requirements.

CSO: 5100

SECOND REACTOR IN RAJASTHAN PROJECT READY SOON

New Delhi PATRIOT in English 9 Oct 80 p 5

[Text] Jaipur, Oct 8 (PTI, UNI)--The Atomic Reactor of the 210 mw second unit of the Rajasthan Atomic Power Project (RAPP) near Kota, became 'critical' today.

According to official reports reaching here, the unit is expected to start trial generation of power within the next one or two months.

However, it would take three to four months for commercial commissioning of the second unit.

The Rajasthan power grid is expected to be richer by about four million units with the commissioning of this Rs 200 crore second unit.

While the first unit of the RAPP was commissioned with the technological help of Canada in December 1973, the second unit has been built up with 95 per cent indigenous knowhow. About 80 per cent of its parts have been manufactured in India.

The second unit is using heavy water imported from the Soviet Union.

A heavy water plant is also under construction near Kota to meet the needs of Rajasthan atomic plants.

Despite lack of experience, the Indian units successfully manufactured most of the sophisticated equipment required for the project.

The order for eight steam generators for RAPP-II placed with a Bombay firm, constituted the first important contract given to an Indian supplier for complete manufacture of a major equipment in the nuclear portion of the plant.

The public sector Bharat Heavy Electricals Limited Bhopal and the Central Workshops of the Bhabha Atomic Research Centre, Trombay, helped in the manufacture of extremely sensitive and sophisticated equipment for the Candu (Canada Deutrium Uranium) reactor, which uses natural uranium as fuel and heavy water as moderator.

Earlier estimates put the cost of RAPP-II at over Rs 67 crores stoppage of export of nuclear equipment and material to India by Canada following India's Pokhran test in 1974 and postponement of the date of commissioning of the plant (originally in 1974) have increased the cost substantially.

The price has more than trebled from the 1971 level, thereby increasing the overall costs.
CSO: 5100

RAJASTHAN NUCLEAR PLANT NEARING COMPLETION

Karachi DAWN in English 25 Oct 80 p 8

[Text] New Delhi, Oct. 24--India's largest heavy-water plant at Kota in Rajasthan is nearing completion and will be operational by the end of next year.

The Rs 640-million (80-million-dollars) project with a capacity of 100 tons of heavy water per annum has been built entirely by Indian technician.

The Kota plant is utilising the process developed by the Bhabha Atomic Research Centre (BARC) in Bombay to produce heavy water. The energy requirements (steam and power) of the plant would be met by the Rajasthan atomic power project.

The Kota plant is one of the five heavy-water facilities in the country. The others are at Nangal, near Punjab, with a capacity of 14 tons; Baroda in Gujrat (66 tons); Tuticorin, Tamilnadu (72 tons); and Talchar, Orissa (32 tons). The plants at Nangal, Baroda and Tuticorin are fully operational while the Talchar unit will be commissioned shortly.

It required some nine years to complete the Kota project. The capital outlay involved nearly Rs 170 million (21,25 million dollars) in foreign exchanges.

Meanwhile, India's second atomic power plant at Kota, located near the heavy-water plant has become critical and will start generating power from the new year. This is the second unit of the plant with a capacity of 220 mw. The first unit which started production in 1973 has since generated 5,000 million units of electric power.

The country's first atomic power plant which has been in operation since 1969 is located at Tarapur near Bombay.

India is constructing two more atomic power plants--one at Narora in Uttar Pradesh and another in Madras.--UNI

CSO: 5100

BRIEFS

DANGER AT NARORA NUCLEAR PLANT--New Delhi, 27 Oct (AFP)--A Delhi scientist has warned Prime Minister Indira Gandhi's government of a possible nuclear disaster if the Narora atomic power project, about 100 km from here, was not shut down immediately. The 470-megawatt project is on the banks of the River Ganges in a seismic zone, only 50 km from an active earthquake fault area, Dr Direndra Sharma, professor of science policy at the local Jawaharlal Nehru University told the National Academy of Sciences here. He said that any untoward nuclear accident to the atomic station "is likely to turn the fertile agricultural soil into a death-land for thousands of years to come." The spillage of radioactivity into the River Ganges would be disastrous as the river flows 1,000 km into the Bay of Bengal passing through the three most populated states of Uttar Pradesh, Bihar and West Bengal--which have a combined population of about 200 million, he said. "An accident in a nuclear plant is a real possibility. If that happened at Narora, the Ganges would be contaminated," Dr Sharma said. Declaring that the Narora station had been set up in "total disregard to our environment," he urged immediate stoppage of the project purely on grounds of safety. Since India's nuclear power programme started in the early 1960's there have been only four accidents. In 1976, a mini-explosion damaged the heat exchanger of India's second heavy water plant at Tuticorlin. A year later, a mysterious explosion blew up the French-built heavy water plant at Baroda. Fire broke out and destroyed part of the nuclear fuel complex in Hyderabad in 1977. Early this year pipe leaks were detected in a research reactor on Bombay. Two exchange towers meant for the heavy water plant at Talcher, in Orissa State, fell into the sea while on their way to India from Hanover in a West German ship in 1975. [Text] [BK260944 Hong Kong AFP in English 0844 GMT 26 Oct 80]

CSO: 5100

NUCLEAR ENERGY PANEL ESTABLISHED

Jiang Shengjie, Head

OW030745 Beijing XINHUA in English 0731 GMT 3 Nov 80

[Text] Beijing, 3 Nov, (XINHUA)--The State Scientific and Technological Commission has announced that it set up a special nuclear energy panel on October 30. This and other special panels already in existence will provide the commission with expert advice on major science policies.

The new panel is headed by Jiang Shengjie, well-known specialist in nuclear chemical engineering and a vice-minister of the Second Ministry of Machine Building. The panel's 38 members are nuclear specialists and science administrators from the Second Ministry of Machine Building, the Ministry of Power, the First Ministry of Machine Building, the Ministry of Metallurgical Industry, the Ministry of Chemical Industry, the Ministry of Education, the Chinese Academy of Sciences and the Office for Environmental Protection under the State Council.

Jiang Shengjie told XINHUA that China had already put the development of nuclear energy and the construction of nuclear power stations on its agenda. He said that sub-panels would be set up to deal with nuclear fuels, equipment, safety and protection and other matters. He said he intended to draw more younger specialists into the sub-panels. Jiang said that the task of his panel was to provide the State Scientific and Technological Commission with workable proposals concerning technological policies, development orientation, major projects, training and use of personnel, technology imports and the spread of research results of Chinese scientists.

Functioning under the direction of the State Scientific and Technological Commission, the new panel will draw up or amend short-term and long-term development plans, ensure that major research projects make scientific and economic sense; and coordinate the various departments concerned.

Experts Urge Development

OW030752 Beijing XINHUA in English 0737 GMT 3 Nov 80

[Text] Beijing, 3 Nov (XINHUA)--Some one hundred nuclear scientists and energy specialists have told the government that a long-term, stable policy of nuclear energy development is important for solving the energy problem. They have proposed the construction of six nuclear power stations of the million kilowatt class, with two each in Guangdong Province, in East China and in Liaoning Province, all areas where there is an acute power shortage. The new plants could be completed between 1988 and 1991.

The call followed the recent agreement in principle between the Chinese premier and the French president on China buying two complete sets of nuclear power station equipment from France. The agreement has been widely see as an indication that the Chinese Government has put the development of nuclear power stations on its agenda.

The exponents of nuclear power generation, including nuclear scientists, engineers and science administrators, gathered at a meeting called by the State Scientific and Technological Commission, the State Planning Commission and the State Energy Commission in Beijing between October 27 and November 1.

Wen Kui, deputy director of the power bureau of Guangdong Province, reported at the meeting that discussions were underway between the province's power bureau and interested quarters in Hong Kong on the possibility of joint investment in a nuclear power station in the province. Guangdong lost 7,500 million yuan in industrial output value last year because only 61 percent of its electrical power requirements could be met. The province is deficient in coal, oil and water resources, and shipment of fuel from other provinces would burden the already overloaded transportation facilities.

Professor Lu Yingzhong, from the Nuclear Technology Institute of Qinghua University, forecast China's energy needs for the next three decades. He said that China was rich in coal deposits, but in relation to population size, even they were limited; that China was short in petroleum resources on a per capita basis; and that though the theoretical figure for per capita water resources was quite high, the geographical distribution was such that the needs of various areas could not be met. Professor Lu Yingzhong maintained that though economizing on fuel was a way out in the short run, nuclear power was the best long-term alternative energy source for energy hungry regions.

Representatives from east China and Liaoning Province stressed the fact that their regions were in bad need of nuclear power stations. The scientists and other specialists noted that China had already developed nuclear capabilities in the course of developing nuclear weaponry and that it was capable of developing nuclear power stations by relying mainly on its own efforts, supplemented as necessary by imports of equipment and technology.

The specialists recommended generating units of 900,000 kilowatts as standard. They left reactor-type open for further discussion, without prejudice to the projected station in Guangdong, which would be of the high-pressure water type.

Those attending the conference suggested the establishment of a nuclear energy leading group within the State Energy Commission. Composed of leaders of concerned ministries and commissions, the leading group would draw up a long-term nuclear energy development plan and coordinate the efforts of the various ministries concerned. Measures relating to nuclear safety were also discussed at the meeting.

Toxic Materials Transportation

OW0207Z2 Beijing Domestic Service in Mandarin 1200 GMT 1 Nov 80

[Text] The Ministry of Railways decided that beginning 1 November 1980 special freight cars will be used to transport toxic articles. This decision is aimed at preventing toxic articles from poisoning or causing pollution for people, animals and other cargoes and at ensuring the people's health while such articles are transported by rail.

The decision provides that a special car be used only for loading and transporting toxic articles, radioactive ore and other dangerous articles. Other freight cars cannot be used to transport toxic articles.

CSO: 5100

EXPERTS SAY MAIN ENERGY SOURCE MUST BE NUCLEAR POWER

Seoul THE KOREA HERALD in English 1 Oct 80 p 8

[Text]

Energy experts say that nuclear power needs to become the country's main energy source in the future. They believe the future nuclear power plants will be operated safely.

These experts expressed the view in a seminar held at the Lotte Hotel Monday, under the theme of "Energy Crisis and Atomic Industry." The lecturers included legislator Paik Young-hoon, Lee Sang-heon, nuclear safety department chief of the Korea Atomic Energy Research Institute, Lee Sung-won and Chong Chang-hyon, both Seoul National University professors.

Future utilization of nuclear energy is a "must" in a country lacking in natural resources, these speakers said.

Although the construction of nuclear power plants is costly, the plants will play the most important role for the supply of energy in the future because such natural resources as coal and petroleum will become exhausted in a few decades, lecturers said.

The safety problem has been examined since the operation of a nuclear power plant started in Kori.

The reliability and safety of nuclear power plants is increasing as new types of atomic reactors are being developed, they said.

According to a government's plan, a total of 44 nuclear power plants will be constructed by the end of the year 2000.

CSO: 5300

CEMA COOPERATION IN NUCLEAR POWER DEVELOPMENT VIEWED

LD282320 Moscow Domestic Service in Russian 0730 GMT 28 Oct 80

[Station commentary]

[Text] CEMA specialists have attended the 97th session of the Standing Commission of the Electrical Energy Council in Moscow and Zaporozhye. Special attention was paid to the acceleration of nuclear power, the organization of the serial construction [potochnoye stroitelstvo] of stations working on the peaceful atom.

Our commentator underlines that the socialist countries would not have won, but, on the contrary, lost, had they, when planning the development of their national economies, not tried to create the most effective and rational power industry based on the most economic utilization of the vast wealth at our disposal. Nuclear power is among the first to open up this path. It not only hands to man the key to a practically inexhaustible source of energy, but also means the creation of one of the most advanced modern industries serving as a powerful accelerator of technical and scientific development.

This important prerequisite has become the basis for a long-term target program of cooperation among CEMA countries in the field of energy, fuel and raw materials to cover the period up to 1990. Specialists assume that the implementation of this program will make it possible for European community member states to increase electricity consumption by about 1.5 times. The main direction of reciprocal action will be aimed at the building in these states, as well as on Cuba, of nuclear power stations with a total capacity approaching 37 million kilowatts, as well as of two nuclear power stations of 4 million kilowatts each on the territory of our country.

The Soviet Union plans to double by the end of the next 5-year period the capacity of nuclear power stations. The Kalinin, Rostov, Khmelnitskiy and Zaporozhye AES will start generating electricity, which, by the way, were visited by the members of the standing commission of the CEMA. The Soviet experience is invaluable as far as their colleagues in the community member states are concerned. This was frequently pointed out at the session. It is a fact that nuclear power stations are being built in Kozlodoui in Bulgaria, Paks in Hungary, and Bohunice in Czechoslovakia with Soviet participation. Power machinery for these stations is being supplied by the Soviet Union. Therefore, the significance of the Atommash, the pacemaker in native power engineering, for the nuclear power industry will grow as the target program of CEMA cooperation in the field of the power industry becomes more concrete. It must be stated that all member states of CEMA are making their contribution to cooperation; this holds true primarily of Czechoslovakia, which has the capacity to produce complex equipment for nuclear power stations for dozens of the most developed countries of the world.

CSO: 5100

NUCLEAR POWER STATION PLANS, CONSTRUCTION UPDATED

Prague HOSPODARSKE NOVINY in Czech 19 Sep 80 pp 1, 11

[Article by Eng Vladimir Farka and Eng Stanislav Kain, ScC, Office of the Presidium of the CSSR Government: "Magnificent Vistas"]

[Text] In accordance with the decisions of the 15th CPCZ Congress, an important role in the development of the Czechoslovak fuel and energy base has been assigned to the nuclear power engineering complex which can be built only with extensive international cooperation. For that reason the CSSR is participating in large-scale integration programs of the CEMA member states. A prominent place there belongs to our cooperation with the USSR which follows an old tradition and which has enabled us to benefit from the experience and knowledge gained in the construction and operation of nuclear power stations in the USSR over a quarter of century.

Many positive results have been achieved in their development thus far. We have a fairly extensive scientific technical base, and are building capacities where we are manufacturing basic types of equipment. By acquiring them the CSSR placed itself among the limited number of manufacturers producing this sophisticated and challenging technology. The most important fact, however, is that the era of industrial exploitation of nuclear energy in the CSSR was inaugurated by the introduction into operation of the V-1 nuclear power plant in Jaslovske Bohunice with total installed capacity of 880 MW.

The Program for Cooperation Between the CSSR and the USSR in the Area of Nuclear Power Engineering Until 1990, signed by the premiers of both countries in June of this year, represents a new, qualitative stage in mutual relations. In the first place it concerns extensive long-range cooperation in the construction and operation of nuclear power capacities in the CSSR and in the manufacture of technological equipment, conception of the direction and the most efficient exploitation of our scientific research base, and the creation of preconditions necessary for the fulfillment of obligations arising for the Czechoslovak party from multilateral agreements within the CEMA community and from our bilateral agreements with the USSR.

The construction and operation of nuclear power engineering capacities is one of the most extensive sectors of the program. In the objectives contained in the program it is envisaged that nuclear power plants with total installed capacity of 7,280 MW will be put into operation before 1990 in such a way that 5,280 MW will

be furnished with VVER 440 reactors (12 units) and 2,000 MW with VVER 1,000 reactors (2 units).

An essential task in the further development of our electrification system will be transferred to nuclear power engineering as soon as in the next, i.e., the Seventh Five-Year Plan. The total increment in generation of electric power during the period until 1985 will amount to 15 billion kWh, of which nuclear power plants will produce 12.7 billion kWh, or about 85 percent.

In order to fulfill this task, two units furnished with VVER 440 reactors must be put into operation in the V-2 nuclear power plant in Jaslovske Bohunice and four such units in the nuclear power plant in Dukovany. Both power plants are being built in cooperation with the USSR on the basis of intergovernmental agreements concluded in 1970 and 1976, respectively. Thus, in 1985 nuclear power plants will have total installed capacity of 3,250 MW.

The challenge posed by this task is evident from the fact that six units with VVER 440 reactors must be built during the 1981-1985 period, although in the current five-year plan we have completed the construction of two units. At the same time, the extent of construction works and the share of supplies of technological equipment from our own production will be substantially expanded over the preceding period. This task is becoming increasingly difficult because of the shortfalls occurring in the course of their construction thus far.

Moreover, the construction of nuclear power plants must begin in the Seventh Five-Year Plan. They must be put into operation in the 1986-1990 period so as to provide continuous increases in the generation of electric power. Basic problems in the selection of a construction site for the nuclear power plant in Mochovce, okres of Levice, have been resolved and now we may expect that appropriate intergovernmental agreements with the USSR will be signed in the immediate future. This will be the last construction of a nuclear power plant equipped with VVER 440 reactors, after which nuclear power plants will be built with VVER 1,000 reactors. The first power plant furnished with such reactors will be located in South Bohemia. The Soviet party has agreed to cooperate in the preplanning stages and in operations connected with the selection of the construction site; that site is already being prepared for construction.

Furthermore, the program contains instructions to both parties that they promptly discuss questions pertaining to the schedule for the construction of nuclear power plants with VVER 1,000 reactors where operation is to be launched after 1990. It is presumed that capacities with the volume of 1,000 MW annually will be put into operation during that period.

Appropriate Czechoslovak and Soviet organizations will jointly implement objectives stipulated for planning of nuclear power plants, including problems in pre-planning and planning operations. At the same time, the Soviet ogranizations will act as general planner and design basic technological projects. Czechoslovak organizations are processing plans for individual power plants with VVER 440 reactors to an extent which both parties will approve in individual instances. Moreover, they will plan technological projects for power plants furnished with VVER 1,000 units in accordance with the general planner's technical assignments for individual

systems of power plants. The scope of our participation in overall planning is expected to increase in the future. In order to master that task, the necessary planning capacities must be established, and by the same token, planning operations must be managed more efficiently, Soviet planning documentation must be utilized more advantageously, and also, the standard of the technological equipment in planning organizations must be improved so as to render the work more productive.

Planning, construction and operation of nuclear power plants in the CSSR will be based on the nuclear safety program adopted in the USSR and on valid Soviet standardization and technological documentation. This makes it possible to adopt the experience confirmed in the USSR and to concentrate our own capacities in full on control and supervision of compliance with nuclear safety regulations.

The construction of nuclear power plants with VVER reactors in the CSSR and USSR provides objective precondidions for the development of cooperation in their operation on a qualitatively higher level than that encountered thus far in the cooperation in conventional power engineering operations, starting with a joint approach to the solution of problems concerning launching of operations, and extending up to organizing repairs of the equipment initiating the most efficient possible production and supply of spare parts. Furthermore, both parties consider it beneficial to exchange information concerning the detection and correction of defects in the equipment and concerning standardization of documents and regulations pertaining to its operation. Also, the experience applicable in training of professional personnel is invaluable to us. Thus, this involves numerous relevant problems whose conceptual solution and specific elaboration must be immediately approached.

In harmony with the demands of our fuel and energy balance, the CSSR cooperates also in the development of nuclear facilities supplying heat by utilizing nuclear power plants with heat take-off or nuclear heating plants. In this respect it has been agreed to deal with problems concerning the cooperation in the planning and production of the equipment after the construction of such projects in the USSR is completed. However, this is not merely a matter of the construction of such facilities; the same attention is needed for prompt planning and coordinated construction of appropriate thermification networks. It is therefore desirable to intensify conceptual programs in that area substantially and to anticipate specific decisions that may be adopted on the basis of the results achieved in the USSR and on the basis of general objectives in the development of heat supply systems in the CSSR.

Cooperation in the production of the equipment for nuclear power plants with VVER 440 and VVER 1,000 reactors, both for our own needs and for export, holds an important position in the program. That cooperation stems from valid bilateral Czechoslovak-Soviet agreements on cooperation in manufacturing the equipment and from the Agreement on Multilateral International Specialization and Cooperation and Mutual Supplies of Equipment for Nuclear Power Plants for the 1981-1990 Period, dated 28 June 1979.

This cooperation is linked with the results achieved in the production of such equipment during this five-year plan. The CSSR was one of the first CEMA member countries to participate extensively in cooperation with the USSR in the production

of equipment for nuclear power plants with VVER 440 reactors, and spent billions for the construction of appropriate metallurgical and engineering capacities in the Skoda plants in Plzen, the Klement Gottwald Iron Works in Vitkovice, the SES in Tlmace, the VTZ in Chomutov, and in other plants. Some operations had to be organized from the ground up, others to be fundamentally remodeled. Many basic types of equipment, which are manufactured proficiently, are exported to the USSR, the GDR, and the Hungarian People's Republic. The first pressure tank for a reactor was delivered this year for the Paks nuclear power plants in the Hungarian People's Republic.

Equipment for VVER 440 reactors will be manufactured even after 1980; the plan calls for seven complete sets of reactors for export and for ten sets for our domestic needs.

At the same time, the production of equipment for nuclear power plants with VVER 1,000 reactors is now in its planning stage. The contents of the nomenclature for such equipment are connected to a major degree with the nomenclature for the equipment for nuclear power plants furnished with VVER 440 reactors installed specially in the CSSR. Moreover, on the basis of multilateral specilization the CSSR will manufacture control panels with apparatus for control and operating systems, including computers and apparatus for the neutron flux control. Czechoslovak engineering enterprises will manufacture 65-70 percent (in weight) of the total volume of specialized basic equipment for nuclear power plants with VVER 1,000 reactors.

Specialized equipment for the CSSR will be manufactured either on the basis of Soviet documentation--for instance, reactors, steam generators, positive displacement compressors, circulation supply pipelines--or on the basis of Czechoslovak documentation--for example, turbines, generators, reclaiming apparatus, condensation, some separators, certain special pumps, fittings, unit desk equipment, etc.

As for turbosets, the program envisages a 1,000 MW turbine with 3,000 rpm and a 1,000 MW generator--in other words, a monounit. Negotiations concerning the delivery of a turbine with the above-mentioned parameters are currently under way.

The CSSR will import some other equipment specified in the agreement from other CEMA countries with specialized production and from the Socialist Federative Republic of Yugoslavia, including, for instance, emergency cooling apparatus for the active zone, main circulating pumps, high-pressure equipment, cranes, transport technology, biological safety equipment, special heat exchangers, special water purification systems, diesel sets, etc.

During the preparations for the production of the VVER 1,000 equipment it appeared that the production base must be completely furnished and constructed. That calls most of all for investments to obtain the necessary materials, production technology and some other needs unlike those for the VVER 440 models. Decisions concerning the investments are being adopted gradually.

The fuel cycle in nuclear power plants holds a specific position in the program. It applies the economic efficiency and competitiveness of our nuclear engineering, which is linked simultaneously with ecological hazards stemming from the operation

of power plants. It is therefore axiomatic that both parties are trying to set up the most advantageous operational procedures.

As for scientific-technical cooperation, the program presupposes more efficient employment of our scientific research base, focusing primarily on the solution of problems in the development of the Czechoslovak nuclear energy complex. More than ever before it must participate in the solution of specific problems related to the construction and operation of nuclear power plants, such as, for instance, upgrading their technical-economic standards, exploiting nuclear fuel and making their equipment more reliable.

Even the expansive scope of the program for the development of nuclear power plants with light-water reactors does not obscure the more distant future. For that reason, the CSSR participates in programs for the development of fast reactors with a sodium cooling system as a part of multilateral cooperation of the CEMA countries.

The development of the nuclear energy complex, which implements one of the most relevant long-range structural changes in the Czechoslovak national economy, includes also capacities which supply construction and technological equipment and which thus directly affects the construction of our nuclear power engineering industry. Such capacities must be built in the required scale and within the required time, in accordance with the objectives of the construction and operation of nuclear power facilities. This is an extensive programs which calls for considerable investments, material costs and the human factor. We could not deal with such tasks by ourselves, and for that reason, our nuclear power complex must be developed in narrow cooperation with the CEMA member countries, above all, with the USSR, and multilateral and bilateral cooperation in this sector must be constantly intensified. The adopted program of cooperation with the USSR in nuclear power engineering determines the correlation of the development of our own capacities with international socialist division of labor and the CSSR's fruitful participation in that effort. The CSSR Government therefore ordered that a system of measures for its implementation and further application be prepared before the end of this year.

Specific measures must be based on the premise that fundamental clarification of the objectives in the development of nuclear engineering with a long-range outlook makes it possible to quantify the required investment and material funds and their volume, the desired technological standard and dependability of the equipment, and the effect on the territorial structure of individual areas. This calls directly for a joint, comprehensive approach and for the necessary and substantial improvement of quality in planning and management operations in the development of our nuclear energy complex in general, and of its individual divisions in the central sector, as well as in economic production units. At the same time, it is necessary to realize that the outlined tasks will be implemented during a period of major structural changes in our fuel and power economy, and that the prospects of our national economy must be fully respected and in particular, its efficiency must be improved.

Furthermore, we are of the opinion that the interrelations of the long-range concept for the development of our nuclear energy complex as a whole, and of its individual

sectors, must be analyzed to far greater depth, and balanced objectively as well as chronologically up to the level of supplier-consumer relations. The experience gained from preceding programs has shown that a great many problems have not been adequately pinpointed. This not only leads to quantitative changes of the original projections, but frequently also necessitates adoptions of measures whose implementation calls for initially unforseen funds and means. It is highly desirable that in the future, frequent changes in submitted proposals be avoided if they do not stem from more advanced knowledge or from the complexity of the problem in question, but rather from inferior technical and economic standards and from a lack of responsibility on the part of the proponents.

Moreover, as the party and economic organs have already emphasized, the investment and planning groundwork must be substantially improved, and thus, thorough coordination and extensive cooperation in operations of all supplier organizations will be achieved, and planning and construction management as well as launching of individual capacities into operation will be generally improved. At the same time attention must be focused on planning of the construction works (selection of the building site, site development, etc.) and on the progress of construction assembly works. The above-mentioned procedures, which in our country tend to be insufferably protracted, negatively affect the schedule of the construction. In our opinion it is also desirable to consider the feasibility of adopting necessary organizational measures in investment as well as in management in general.

The implementation of the demanding and complex tasks stemming from the construction of our nuclear energy complex calls for appropriate training of workers with high qualifications and professional skills. As concerns their number and their diverse professional qualifications, all branches participating in this process must meet those requirements with focus on their objectives.

The development of our nuclear power engineering is based on the VVER light-water reactor. In terms of the development of the scientific technological procress, it may be presumed with confidence that such reactors will continue to be introduced into operation even in the 1990's, particularly in the first half of that decade. Analyses of long-range outlooks indicate that nuclear capacities with about 12,000 MW output must be built over the next 15 years in the CSSR. This represents four-fifths of total installed capacities in conventional power engineering built up to this day.

This provides preconditions and opportunities for a magnificent as well as an ultimately efficient approach not only to nuclear energy capacities, but also to the construction of the material base for their building and operation and for the CSSR's effective participation in the international division of labor in that area. This expresses precisely the immense significance of the agreements and of the further specific fulfillment of the program for the CSSR-USSR cooperation in nuclear power engineering.

9004
CSO: 5100

POSSIBLE DATES FOR NUCLEAR PLANTS OPERATION NOTED

PY251234 Buenos Aires LA RAZON in Spanish 21 Oct 80 p 8

[Excerpts] Vice Adm Carlos Castro Madero, chairman of the National Atomic Energy Commission [CNEA], estimates that in the year 2000, the CNEA will be ready to put into operation "600mw nuclear plants, one each 12 or 18 months." He asserted that the Argentine nuclear plan implemented last year "is on schedule--that is, the next four natural uranium nuclear plants with heavy water moderators will be put into operation in 1987, 1991, 1994-1995 and 1997."

In a lecture last night at the Argentine Scientific Society, the CNEA chairman said that "since the beginning of its operation, the Atocha 1 nuclear plant has given a highly satisfactory performance, thus, becoming one of the most effective nuclear plants in the world, taking into account the percentage of actual generated energy as compared to the maximum possible energy that can be generated."

Castro Madero asserted that the Arroyito heavy water production plant, which "will begin operating by the end of 1981, will supply the necessary water for the four future nuclear plants."

Concerning international cooperation, Castro Madero noted that Argentina is the first developing country to develop a significant program for the transfer of technology to another country.

CSO: 5100

GOVERNMENT PASSES NUCLEAR POWERPLANT SAFETY LAW

Rio de Janeiro JORNAL DO BRASIL in Portuguese 8 Oct 80 p 19

[Text] Brasilia--A decree-law signed by President Figueiredo created the Brazilian Nuclear Program Protection System [SIPRON] to insure complete planning and coordination of measures which attend to "the safety needs of the Brazilian Nuclear Program and its personnel" and the people and the environment related to it.

The justifications by Secretary General of the National Security Council (CSN) Gen Danilo Venturini say that the "present stage of implementation of the nuclear program calls for the urgent establishment of a system of protection which will show the concern of the government with the safety of the Angra I powerplant installations.

Makeup

SIPRON shall be coordinated by the Secretariat General of the CSN, and will consist of the National Nuclear Energy Commission (CNEN)--responsible for safety in the field of physical protection, national safeguards, nuclear technical safety and radiological protection--and the Secretariat for Labor Safety and Medicine (SSMT) of the Ministry of Labor in the field of labor safety and medicine; of the Special Secretariat for Civil Defense (SEDEC), for the protection of the Brazilian population in emergencies; of the Special Secretariat for the Environment (SEMA) of the Ministry of Interior, and of the National Intelligence Service (SNI) Central Agency in the area of intelligence.

Pursuant to the decree-law, safety requirements refer to the adoption of measures for the physical protection of persons residing in areas near nuclear powerplants; nuclear technical safety and radiological and environmental protection. Gen Danilo Venturini says that the safety of nuclear installations will become more and more complex with the successive installation of other units after the Angra I Powerplant goes into operation, and with the subsequent transportation of nuclear materials among the powerplants.

SIPRON consists of the bodies and agencies of the federal, state and municipal administrations, private companies and foundations which have anything to do with the Brazilian Nuclear Program. These agencies are going to receive standard-setting instructions from SIPRON without prejudice to their status of subordination in the organization in whose administrative structure they may be located.

8908
CSO: 5100

ELETROBRAS NUCLEAR PROGRAM TAKEOVER RUMORED; DENIED

Program Management Change Rumored

Brasilia CORREIO BRAZILIENSE in Portuguese 8 Oct 80 p 4

[Text] General Costa Cavalcanti, president of ELETROBRAS [Brazilian Electric Power Companies, Inc.], announced yesterday after a hearing with Minister of Mines and Energy Cesar Cals that there were "very advanced" studies whereby the company would become the manager of the Brazilian nuclear program instead of NUCLEBRAS [Brazilian Nuclear Corporations], whenever the government considered it opportune. The subject, however, as he explained, is still in the formative phase, there being nothing concrete for the adoption of a political decision as yet.

Refusing to comment on the future of NUCLEBRAS, that is, what its role would be in the nuclear programing of the country, the president of ELETROBRAS and the Itaipu Binational revealed that any statement on the subject would be premature, saying that he has just taken on a job where "several subjects are matters of concern at the same time, each of them requiring its own solution." The general, however, promised to talk to newsmen after there is a government decision, saying that the measure still depends on analyses by other official agencies.

Cavalcanti Denies Rumor

Rio de Janeiro JORNAL DO BRASIL in Portuguese 9 Oct 80 p 19

[Text] The president of ELETROBRAS and director general of the Itaipu Binational, General Costa Cavalcanti, yesterday denied that he had stated the National Security Council recommended that management of the Brazilian nuclear program be given to ELETROBRAS.

"The reports published in the newspapers have no basis on facts," said General Costa Cavalcanti. "I did not say what the newspapers published. When the newsmen asked me what news there was on the management system of the nuclear program, I simply replied that I knew nothing of the affair, since I have only been a week in ELETROBRAS, I have not yet examined it," he added.

The president of ELETROBRAS declared that in the interview he granted in Brasilia, when asked about the existence of studies on the question he replied that "I was not sure but possibly there were studies of which I did not know."

The president of NUCLEBRAS, Ambassador Paulo Nogueira Batista, declared through his press adviser that he had no comment to make because he only learned of the affair through the newspapers.

The question of management of the nuclear powerplants is an old dispute between NUCLEBRAS and its subsidiaries on the one hand, and ELETROBRAS and its subsidiaries on the other. The dispute became public at the beginning of last year when NUCLEBRAS began to advocate that the task of managing the civil construction and installation of the nuclear powerplants to be built in the country be turned over to its subsidiary NUCLEN [NUCLEBRAS Engineering, Inc.]. By doing this NUCLEN would take charge of all phases of powerplant construction since it already is in charge of preparing the engineering plans and choosing equipment suppliers and prices. Through that mechanism, the electric companies would only be in charge of the operation of the plants, without any great input into decisions made during the construction phase. ELETROBRAS and the electric sector as a whole have rebelled against that demand by NUCLEBRAS. The arguments by the electric power companies are that after all it is their budget which provides the money for the construction of those nuclear powerplants and that according to law they are responsible for any harm caused by the operation of the powerplants.

The arguments from both sides were taken to the National Security Council, which has been studying the subject for months. The arrival of General Costa Cavalcanti in ELETROBRAS undoubtedly will strengthen the position of the electric sector. The General is known to be a "dam man", that is, an advocate of primary priority for hydroelectric powerplants.

Minister of Mines and Energy Cesar Cals declared in Fortaleza that the management of nuclear powerplants "is still under discussion and no decision has been made up to now." He said that the decision depends on President Figueiredo.

The secretary general of the Brazilian Physics Association [SBF], Luiz Pinguelli Rosa, said yesterday in Rio that the decision by the government to create the Brazilian Nuclear Program Protection System (SIPRON) is a measure resulting from the work of the scientific community which criticized the inadequacy of the institutional safety system of the nuclear installations in the country. However, he considered the measure as only partial because "Our demands also asked for the opening of the licensing process to participation by the public and the independent scientific community of the nuclear sector."

8908
CSO: 5100

CNEN CHIEF UNAWARE OF CHANGES IN NUCLEAR MANAGEMENT

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 8 Oct 80 p 25

[Article by Tarcisio Baltar: "CNEN Says It Is Unaware of Decision"]

[Text] National Nuclear Energy Commission President Hervasio Carvalho said yesterday he did not know of the existence of studies to have ELETROBRAS [Brazilian Electric Power Companies, Inc] manage the Brazilian nuclear program instead of NUCLEBRAS [Brazilian Nuclear Corporations]. He declared he is also unaware of the government decision to postpone the conclusion of the present Brazilian program for 10 years, which means that the eighth powerplant of the program would only be ready in the year 2000 and not in 1995 as was forecast after the first postponement.

Apparently surprised at the questions on those two changes in the area, Carvalho declared that he did not wish to make any comments. In areas of the energy sector, however, there had already been talk of the possibility of changes in NUCLEBRAS as of the moment when General Costa Cavalcanti accepted the invitation to head ELETROBRAS without having to leave his post as director general of the Itaipu Binational.

The Great Enemy

Important and influential technicians of the hydroelectric sector, who took part in the Second Western Hemisphere Energy Symposium, learning on 25 that Costa Cavalcanti would be the new ELETROBRAS president, said that the promotion in the energy sector of the former minister would mean many headaches for those responsible for Brazilian nuclear policy. They explained that as the main advocate of hydroelectric plants, Costa Cavalcanti made himself indirectly "the most terrible enemy of the nuclear policy."

The same technicians recalled that the official argument for the construction of the eight nuclear powerplants by 1980 (according to NUCLEBRAS plans) was based on an underestimation of Brazilian hydroelectric potential.

Therefore, for Costa Cavalcanti there is nothing more harmful to his plans in the hydroelectric area than the action by NUCLEBRAS in search of a priority which the former minister always advocated for large dams.

And he made his position very clear when he was sworn in as president of ELETROBRAS on Monday 29 September, when he spoke in his speech on the importance of hydroelectric power, to which he promised he would give priority.

The Second Victory

After adding the presidency of ELETROBRAS to the general directorate of the Itaipu Binational, Costa Cavalcanti has a second great victory in only a few days: The government accepting that ELECTROBRAS should manage the Brazilian nuclear program, now delayed for 10 years, that is, already it is a little less important than previously.

It is even probable that the decision to delay the conclusion of the nuclear program may be a measure directly related to the acceptance of the possibility of turning over command of nuclear policy to ELETROBRAS, or rather, to General Costa Cavalcanti.

In that fashion, the former minister would add the management of the main hydroelectric project of the country, the apple of the eyes of the revolutionary governments, to the holding company of the hydroelectric power sector and to the holding company of the nuclear sector. It is because of this that many well-informed persons are saying that Costa Cavalcanti is today the strongest nominee to candidate for the presidency of the republic.

8908
CSO: 5100

MORE DELAYS IN NUCLEAR POWERPLANT CONSTRUCTION ANNOUNCED

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 8 Oct 80 p 25

[Text] Brasilia--The installation of the nine powerplants stipulated in the Brazilian nuclear program, scheduled to operate together as of 1995 according to the government timetable, will be postponed again because of an absolute lack of resources, according to a prominent source linked to the energy sector in Brasilia yesterday. In an exclusive report to ESTADO, the same source declared that the units will only begin to operate in the year 2000. However, late last night, the minister of mines and energy, Cesar Cals, refuted reports on a slowdown of the program.

The president of ELETROBRAS [Brazilian Electric Power Companies, Inc], General Costa Cavalcanti, also announced yesterday in Brasilia after a meeting with Minister Cesar Cals that "very advanced" studies already exist for the company to begin to manage the Brazilian nuclear program, instead of NUCLEBRAS [Brazilian Nuclear Corporation], whenever the government considers it opportune. However, the subject is still being studied with nothing specific being decided yet that would lead to the adoption of a political decision, he added. Last night in Rio, General Costa Cavalcanti also denied that report.

However, the same government source who revealed the delay in the program reported that one of the priority tasks of new ELETROBRAS president General Costa Cavalcanti will be the preparation of a study showing that a slowdown is "unfortunately necessary because of economic problems." ELETROBRAS will make a study of the costs of the nuclear program, specifically of the agreement signed with Germany--a partnership which will not be dissolved--making forecasts initially of the cost of the first four powerplants and, later, of the last five. That source asserted in Brasilia that the state company will complete a survey of the waterpower potential of the country as soon as possible so as to eliminate once and for all the doubts with respect to the national waterpower resource inventory.

Technology

Although the government does not yet have an opinion with respect to the future role of NUCLEBRAS in case ELETROBRAS goes on to manage the nuclear program, as was revealed and subsequently denied yesterday by ELETROBRAS President General Costa Cavalcanti, governments sectors are already beginning to dispute the

roles of the various subsidiaries of NUCLEBRAS (NUCLEI, NUCLEN and NUCLEP) [NUCLEBRAS Isotope Enrichment, Inc., NUCLEBRAS Engineering, Inc. and NUCLEBRAS Heavy Equipment, Inc., respectively], created specifically to attend to commitments of the agreement signed between Brazil and Germany. According to explanations from the same source, they would not be priority matters today if the government were to sign the same commitment.

At the same time, it is known that there are government sectors which think that CESP [Sao Paulo Electric Company], for example, has the capabilities to build nuclear powerplants providing it did not become subject to the influence of partisan politics, according to the current thinking in certain official circles.

In that case, the ELETROBRAS proposal would not be only the simple sending of students abroad, where many of them will at least learn the German language properly, but the problem of assimilating a part of the technology in that country itself through the development of task forces in universities (which would have more resources and their own specialized departments), in addition to developmental research under the control of the National Nuclear Energy Commission [CNEN] itself.

Caution

The same source also revealed that every revision of the nuclear program in general, or of the agreement with the Germans, in particular, will be made "very cautiously," so as not to offend the authorities of the previous government. For those authorities the program does not contain any errors, only virtues because Brazil found a partner willing to cooperate with the country at a given moment, unlike the United States and France.

The national economic situation, meanwhile, according to the same source, shows that the nuclear program draws further and further away from its initial ambitions, although the problem is treated with much care so as not to offend the authorities of the past and the German partners, who although they understand the problem of delays officially, are already showing impatience.

Central Bank Denial

On the other hand, the Central Bank yesterday denied the existence of pressures from the Deutsche Bundesbank--the West German Central Bank--on German banks to halt loan operations with Brazil. Those were the rumors circulating yesterday afternoon in Sao Paulo and they attributed the slowdown of the nuclear program to that factor.

The Central Bank said it did not yet have any specific information on the subject.

8908
CSO: 5100

BRIEFS

CONSTRUCTION GOES TO NUCON--The responsibility for construction of Angra 2 and 3 nuclear plants which is under the ELETROBRAS subsidiary FURNAS will be transferred to the new Nuclebras subsidiary NUCON to be created in 90 days, Mines and Energy Minister Cesar Cals revealed yesterday. According to the energy minister, the fact that Furnas has already begun the construction of Angra 2 and already made commitments for the construction of Angra 3 will not stand in the way of this transfer of responsibility to NUCON. "The contracts signed by FURNAS will be transferred to the new enterprise," Minister Cals said. With this step, Nuclebras will assume the monopoly over the construction of all nuclear plants in the country, except over that of Angra 1 that is almost completed and that is not under the Brazilian-FRG nuclear agreement. [Excerpt] [PY290108 Rio de Janeiro JORNAL DO BRASIL in Portuguese 28 Oct 80 p 15]

HYDROELECTRIC PRIORITY URGED--Norberto Oderbrecht, vice president of the Norberto Oderbrecht Construction Company, one of the companies responsible for the construction of the Angra I nuclear powerplant, said yesterday that the country must give preference to the use of waterpower resources, which it has in an abundance "instead of seeking to develop the nuclear program at full speed." The statement by Oderbrecht, made after a meeting with Governor Paulo Maluf, surprised several people present at Bandeirantes Palace. Oderbrecht supported the positions of the new ELETROBRAS president, General Costa Cavalcanti, who at his inauguration advocated priorities for hydroelectric plants. He denied he had discussed the construction of nuclear powerplants on the southern coast of the state with the governor. As to the work of the Angra I powerplant, he denied that difficulties are being encountered. In his opinion, if that were so "It would not have been released by the National Nuclear Energy Council." Oderbrecht also said that the work is being accomplished at an accelerated pace and perhaps the powerplant may go into operation next year. [Text] [Rio de Janeiro O GLOBO in Portuguese 3 Oct 80 p 16] 8908

CSO: 5100

ISRAEL MUST HAVE NUCLEAR ENERGY

Tel Aviv MA'ARIV in Hebrew 1 Sep 80 p 5

[Editorial by Professor Z. Hadari: "Israel Has No Choice--Only Nuclear Reactors"]

[Text] It is natural for Israelis to be interested in the energy strategy in Israel. This is a world problem which preoccupies many nations. There is a fear in Israel: we hardly have independent sources of energy and we are at the mercy of the energy producing countries which are not "in love" with us. What is our future in this area?

The whole world knows that world consumption of energy will double before the end of the century, assuming that the per capita consumption remains the same, because of population growth. Everyone knows that in order to develop new sources of energy the following is needed:

Political stability in the world; public understanding; financing; proper management of energy; long range planning; time.

Israel is now entering an era of using coal as fuel for electric power plants. It will use coal at a time when coal can be used more efficiently as gas or liquid. If coal can replace liquid fuel, it will be achieved through developing this technology which is rather expensive but allows extensive production of carbohydrates, methylene etc.

In the future there will be many opportunities to use heat from nuclear power plants to produce coal, which is cheap heat energy. There are still technological problems which have to be solved. Gas from coal is 50 percent more expensive than natural gas. Do we have natural gas for many years?

In the long run coal cannot be our only option. Solar energy, shale oil etc. can only provide a small percentage of Israel's energy needs. Israel has no other choice but to build nuclear reactors to provide electricity.

It seems that there are those who support, reject or doubt nuclear energy in Israel. But it has never been explained to the residents of Israel that they have no other choice.

The government has made a big mistake in not explaining unequivocally since 1973, when energy problems worsened, that there are no real options in the long run to

solve Israel's energy problems, except for building nuclear reactors for energy purposes. Every source needs to be developed, but a comprehensive solution can only be through nuclear energy. Thus the reports that "soon there will be messianic solutions" are dangerous and misleading. Someone may be trying to reassure us in light of the fact that our enemies will withhold conventional liquid fuel from us. Everyone wants to take comfort in the belief that there is a solution to our energy needs.

Until 1977 the United States was the first in developing nuclear energy, but has since slowed down. Congress through the initiative of President Carter approved non-sale of nuclear reactors to countries which would not sign the convention for non-proliferation of nuclear weapons. Since then the initiative of building and developing nuclear energy was shifted to Europe (France, Germany, Sweden, England) and Japan. These countries lead the way. Germany today gets 10 percent of its energy from nuclear sources, and it has coal. The U.S. has energy sources for many years without having to accelerate its nuclear energy program.

Recently a new argument against introducing nuclear energy to Israel has been heard--the incident at Harrisburg, Pennsylvania. This is a decoy, not a reason. The President of the United States has appointed a committee to investigate the matter, which has concluded: 1) It was a human error. 2) Nuclear plants must be made safer. One has to overcome the fear which was artificially created by the Harrisburg incident.

A second argument of the nay-sayers: the problem of disposing of the nuclear waste. What about our neighboring countries, which have introduced nuclear reactors into our region? Nuclear waste is also created in military reactors. If a catastrophe of nuclear waste happens in Syria, Egypt or Jordan, the "China Syndrome" will reach us too, either by land or air.

There are advanced technologies today for storing nuclear waste.

A few words about the cost of a nuclear power plant: the cost of producing electricity either in a nuclear plant or in a conventional one consists of three components: 1) Initial investment of building and equipping the system. 2) Operating cost. 3) Fuel. As for the price, the main component is the fuel. From 1972 to 1978 the cost of nuclear fuel went up 106 percent, while the cost of thermal fuel went up 226 percent. It is known that fuel from coal is 40 percent more expensive than nuclear fuel.

The capital investment in a nuclear plant is larger because of the safety element. A nuclear power plant to be built in Israel cannot be in any way different from a plant built elsewhere. It takes 11 to 12 years to build it, and the investment is spread over 8 to 10 years. It is not possible to plot an energy strategy in Israel without nuclear power plants. France is planning to have its nuclear power plants provide 70 percent of its energy consumption by 1990.

The government must mobilize all sources in Israel, which are not few, to overcome the uncertainty and begin to build nuclear power power plants.

Mobilizing our capability, increasing public information and allaying fears, these are the guarantees to overcome our shortage of energy sources.

9565
CSO: 5100

GROUP BEGINS STUDYING NUCLEAR TECHNOLOGY IN FINLAND

Helsinki HUFVUDSBLADET in Swedish 24 Oct 80 p 19

[Text] A group of 25 Libyan technologists and assistants will take part in a 9-week course in nuclear technology at the National Technical Research Center in Ottaniemi.

The reader may wonder if they are here to learn how to make atomic bombs. We all know of Muammar Qadhdafi's interest in the military aspects of nuclear technology.

"No," said the head of the reactor laboratory, Professor Eino Juhani Kuusi. "They are here to learn the peaceful uses of nuclear power, electrical and nuclear technology from the viewpoint of power supplies. Libya intends to get its own nuclear power plant.

"Our practical applications are far removed from the technology of nuclear weapons," Professor Kuusi said.

"When the course came up in the framework of the Finnish-Libyan joint commission we studied this very question very thoroughly, partly because of everything that has been written about Libya's interest in the atomic bomb and the risks of giving the Libyans nuclear technological knowhow.

"We decided the risks were negligible."

What the Libyans are learning is electrical and nuclear technology which is far removed from the technology of nuclear weapons. The 25 students correspond roughly to 4th-year students of technology here. They come from Al Fateh University which was built by Finns.

"They are future leaders of Libya's electricity and power production and thus very interesting from a Finnish point of view. Libya is busily negotiating with the Soviet Union on delivery of a nuclear power plant which will probably lead to subcontracting opportunities for Finnish industries," Professor Kuusi explained.

The cooperation with the Libyans is a long-range effort. It also provides our lecturers with new experiences, among other reasons because instruction must be given in English.

Imatran Voima and the Technical College also have a group of Iraqi students but they are more at the high-school student level.

They will be studying radiation protection topics. The course lasts for 2 years.

6578
CSO: 5100

BRIEFS

ATOMIC WEAPONS--If other African countries developed atomic weapons it would be shortsighted of the Republic of South Africa not to do likewise, asserted a ranking South African naval officer this weekend at a seminar for strategic studies that was being held in Pretoria. Commodore H. F. Nel did add that from a military and strategic point of view it would not make sense at the moment, however, to develop atomic weapons. South Africa is capable of fending off a combined attack by African countries, even if such an attack had limited support from foreign powers. Most black African countries are relatively undeveloped, explained the Commodore. Hence arises the question of which targets to aim nuclear weapons at. South Africa's future military action depended on the nature of the threat. Nel did emphasize that if circumstances warranted, the South African Government would assume the right to make practical use of the topnotch atomic expertise present in South Africa. Current rapid developments in revolutionary techniques could in a flash wipe out an army's defensive and offensive capabilities. For this reason South Africa's military planners had to strive constantly to remain one step ahead and be armed against surprise attacks. [Text] [Windhoek ALLGEMEINE ZEITUNG in German 20 Oct 80 p 3]

CSO: 5100

SECRET CLAUSES IN SWEDISH-FRENCH NUCLEAR TREATY UNVEILED

Stockholm DAGENS NYHETER in Swedish 24 Oct 80 p 7

[Article by Ingvar Andersson: "Sweden Gets Nuclear Weapon Plutonium"]

> [Text] Sweden is responsible for taking charge of a share of the waste products from the French processing plant for final custody within Sweden. The plutonium which Sweden gets back after processing is of so-called weapon quality--it can be used directly in nuclear weapons without further processing. The French processing plant has no responsibility to account for all the plutonium processed there. An automatic wastage of 3 percent is allowed. If the wastage becomes larger it is not necessary to report what happened to it, but only to pay for it.

These are some of the details of the secret processing agreement which was signed in 1977 between the Swedish nuclear power industry and the French processing company Cogema.

With the help of opponents of nuclear power in Holland and West Germany the agreement has now been made available to the Swedish mass media. Some details of the agreement were disclosed today by two Center Party newspapers, STOCKHOLMAREN and SMALANDSBYGDEN.

The agreement in the hands of DAGENS NYHETER deals with the processing of fuel from Ringhals 3. It was the first agreement signed by the Swedish power industry in compliance with the Nuclear Power Plant Act--a law governing nuclear power safety which was set up by the first Falldin government when it came to power in 1976. The law required an agreement on processing so that new nuclear power plants could be started up.

It is obvious that the Swedish power industry was compliant with the French processing company Cogema when the agreement was signed. Cogema dictated the conditions--all responsibilities on the Swedish side. The words "at the customer's expense" (Sweden's) appear in practically every paragraph of the contract.

The Swedish power company can be required to pour in money to the processing project, but without guarantees to get fuel processed. Instead Sweden can be required to take back the fuel unprocessed and furthermore take custody of the waste products from the plant, or a share of them, for storage.

"Technical obstacles at the processing plant" is a sufficient reason to refuse to receive fuel from Sweden, according to the agreement.

Perhaps the most serious disclosure in the secret contract is that Swedish nuclear power is going to increase the risk of the spread of nuclear weapons.

Cogema will produce weapon plutonium. In principle this will be sent back to Sweden and can therefore be used here for the production of nuclear weapons, or for sale to other countries.

But in the agreement Sweden has also denied itself the possibility of keeping control over the processed plutonium by permitting a "wastage" of three percent which the French need not account for or pay for.

Furthermore the contract contains a section which gives the French the right to retain processed plutonium in excess of the three percent "wastage" provided they pay for it.

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CSO: 5100

REPORT ON DISPOSAL OF NUCLEAR POWER PLANT WASTE

Frankfurt/Main FRANKFURTER RUNDSCHAU in German 26 Sep 80 p 10

[Report by Guenther H. Scheuten, president of the German Society for Reprocessing Nuclear Fuels, with Limited Liability, Concerning Disposal of Waste from Nuclear Power Plants: "What To Do With Spent Fuel Elements from Nuclear Power Plants"]

[Text] The conference of economic ministers recently had Guenther H. Scheuten, president of the German Society for Reprocessing Nuclear Fuels [DWK] figure out for them how fast atomic waste from German nuclear power plants mounts up. This society is an organization in German energy management concerned with the removal of atomic waste. Scheuten analyzes three different directions for energy involving variously high levels of utilization of nuclear energy. His calculations show what sizable quantities of atomic waste will accumulate by the year 2000 and, according to the plans of the Federal and laender governments, must first be placed in intermediate storage facilities. So far there has been no final political decision concerning final disposal.

1. Waste Disposal Requirements

The basis of considering the requirements for waste disposal is the quantity and the accumulation over time of spent fuel elements from German nuclear power plants. In a fact paper which I have taken the liberty of presenting to you in the form of a handout you can read off the waste disposal requirements for three possible variants. These consist of a maximum and a minimum variant, and from what we know today, the set of requirements which is likely to prevail.

a) The maximum variant is based on a nuclear power plant generating capacity of 53,000 MW in the year 2000, which the Federal government and the laender used as a basis in preparing the 28 September 1979 resolutions concerning the disposal of waste from nuclear power plants. In this instance by the year 2000 we will be removing approximately 15,300 tons of uranium in the form of spent fuel elements from German nuclear power plants. In the year 2001 and successive years a minimum of approximately 1,400 tons of uranium will accumulate each year in addition.

At this point, I should like to refer to one difficulty which was not mentioned in the official projections, specifically to the fact that at the termination of the projection periods the requirements for waste disposal will not have ceased, but rather that a new, growing need for waste disposal will develop each year. If we assume in the maximum case being discussed here that even in 2000 there would not be a solution for the final disposal of the spent fuel elements, then this would mean that in every successive year additional intermediate storage of 1,400 tons capacity would have to be created.

b) I would like to contrast the maximum variant with the minimum variant; in the latter, effective 1985 up to 2000 a maximum nuclear power generating capacity of 20,000 MW will be in operation. This minimum variant is based on the assumption that all nuclear power plants currently under construction will be completed and no others will be built. Even in this minimum set of requirements, by the year 2000 approximately 10,000 tons of uranium in spent fuel elements would accumulate, a quantity which would increase by 4,000-5,000 tons of uranium during the period from 2001 until the plants are shut down.

c) Finally I would like to deal with the probable situation, which, of course, does not correspond to the energy-management needs of the years ahead of us, but--assuming consistent political action--does correspond precisely to the practical and technical possibilities for realization. In this case, it is anticipated that in the year 2000 about 40,000 MW of nuclear power plant generating capacity will be available.

This would mean a total of about 14,200 of uranium in spent fuel elements by the year 2000; this quantity would increase annually by at least 1,100 tons of uranium starting in 2001.

From the description of the maximum and minimum situations and the likely set of requirements which is in between you can gather that in all instances in the year 2000 and the following years very substantial quantities of spent fuel elements will accumulate for which there will have to be a final disposal solution. With the concept "final disposal solution," I would like to clearly emphasize that intermediate storage of fuel elements inside nuclear power plants or outside in special fuel-element storage facilities does represent, from the points of view of politics, law and safety, a defensible manner of disposing of waste from nuclear power plants, but such is only an intermediate solution to the problem.

2. Satisfying the Requirements

Satisfying the above-mentioned requirements for waste disposal is done by means of two real waste-disposal measures which, however, are limited in terms of practicality and time; these are the reprocessing of German fuel elements in the French COGEMA (General Company of Nuclear Materials) reprocessing plant and the intermediate storage of fuel elements inside nuclear power plants or outside nuclear power plants in specially designed intermediate storage facilities. On the one hand, these measures for waste disposal are limited by the reprocessing capacity available in France, and on the other hand, by the necessity of removing the fuel elements from intermediate storage in order to move them on to final storage or reprocessing.

You, honored gentlemen, have inspected the French reprocessing plant in Cap La Hague. You know that a reprocessing plant with an annual capacity of 400 tons of uranium (oxidic) is being successfully operated there and that another plant (UP 3a) is under construction. The UP 3a plant will have an annual capacity of 800 tons of uranium (oxidic); beyond that the French are considering the construction of another plant for 800 tons of uranium (UP 3b), however no decisions on it have been made yet. On account of France's large nuclear power plant program, we must proceed on the assumption that in the future the French reprocessing plant will be exclusively used to satisfy France's domestic requirements.

As matters stand and on the basis of the specific statements from agencies in the countries in question, we cannot count on having German waste disposal requirements met in a measure exceeding those already covered by existing agreements.

Intermediate storage of fuel elements is by necessity only temporary. Even if longer periods of intermediate storage in wet and dry storage facilities do not encounter any objections in respect to safety, it is nonetheless totally clear that at a later point in time the fuel elements will have to be removed from the intermediate storage facilities.

Compact storage in nuclear power plants has already been authorized for several nuclear power plants, for others the authorization process is still in progress. Some nuclear power plants have no capability to do this. Licensing procedures for intermediate storage of fuel elements in Gorleben and Ahaus have been initiated. We are figuring on receiving the authorizations for construction and storage during 1981.

The relatively short construction time for such an intermediate storage facility suggests that a first intermediate storage facility for fuel elements will be ready for use in 1982. We think this is necessary in order to have an alternate intermediate storage capability in case there are some problems in connection with intermediate storage in the nuclear power plants or with transporting the fuel elements to France for reprocessing.

Moreover, the situation in respect to our requirements resulted in the fact that at least 4 intermediate storage plants with a capacity of 1,500 tons of uranium per year--up to the year 2000--will be required if by 2000 relief should not be provided by any other waste disposal measures. In this, it is assumed that compact storage capacities in the nuclear power plants will be fully utilized.

[missing words] of the waste disposal requirements by the year 2000 could be accommodated with 350-ton uranium plant which is being planned for a site in Hessia thanks to the initiative of the Hessian Land Government. This plant will, of course, first serve to acquire for the FRG the technology of reprocessing irradiated nuclear fuels; from 1993 to 2000 it could reprocess about 2,400 tons of uranium in the form of spent fuel elements.

After taking this quantity into account for the year 2000 there will be a mountain of spent fuel elements amounting to about 5,000-10,300 tons of uranium, a quantity for which no final disposal solution has yet been made politically. In addition to these quantities we must also add in those fuel elements which by necessity will accumulate every year starting in 2001. Depending on the variant, these additional quantities will range between 520 and 1,400 tons of uranium per year.

The 350-ton uranium plant project in Hessia is being very vigor[illegible]pursued by us--the DWK. Technical planning is fully underway. In the current fiscal year, we will invest about DM100 million for this project, inclusive of development projects.

On the basis of the 28 September 1979 resolutions by Federal and laender government heads"...studies for the design of integrated waste disposal based on research and development results already achieved..." are continuing under the central direction of the Federal government. These studies, however, are limited to those safety

questions which are not being examined in the Hessian licensing procedure. Duplication of effort by the Hessian licensing authority, on the one hand, and the Federal/Laender Committee for Atomic Energy on the other hand will be avoided by this limitation.

Because of the political uncertainties about the disposal route which is ultimately to be taken we have had to discontinue planning for a large reprocessing plant with a capacity adequate for German waste disposal requirements. In view of the uncertain situation in respect to a political decision, we cannot assume the responsibility for the costs which will unavoidably be incurred by planning such a large plant, on the order of about DM1 billion, and the costs could not be charged to the power consumer even by further stretching of the causer-principle.

According to the resolutions by Federal and laender government heads, which were already mentioned, in addition to reprocessing, other waste disposal techniques, as, for example, direct final storage, are being studied. In view of all that we know today, direct final storage can technically be done, as reprocessing has been done for about 25 years, presumably with comparable safety standards.

In terms of its bylaws and its conception of itself our society--DWK--is the German waste-disposal society and is not tied to any technology. If it is politically desirable, we will also undertake direct final storage. Of course, the question is whether direct final storage is really desirable. Its exclusive use would result in the fact that uranium stored in spent fuel elements in the FRG in the year 2000 (about 7,300-13,000 tons) and the quantities which will accumulate in addition every year starting in 2001 would have to be "buried."

However, I should like to emphatically stress that it can be wise to use direct final storage for certain fuel elements. For this reason it is appropriate to develop final storage technology. On the other hand, the following must be clearly stated:

It may of course be possible for direct final storage to be developed to a safety-technical level which approximates that of reprocessing; however, it has basic disadvantages which cannot be technically remedied. In particular, "burying" spent fuel elements results in an economic waste of money, energy and raw materials.

It is recognizable today that the costs of final storage will also be very substantial from the point of view of industrial management. According to Swedish studies, they are said to be 40 percent higher than those of reprocessing. If one compares the technologies of reprocessing and direct final storage in respect to investment and structural policy, then it becomes clear that the economic multiplier effects in the reprocessing sector are considerably higher despite their lower costs. This concerns not only the aspect of possible recovery of energy raw materials, but also the potential for further development which is inherent in reprocessing technology.

Among the big advantages of reprocessing there is first of all the possibility of recycling uranium and plutonium from the spent fuel elements in reactors of modern construction. Based on the year 2000, there would thus be an energy gain, when converted, of 230 to 416 million tons of hard coal units. If the plutonium were used in advanced light-water reactors, so-called high converters, the energy gain would increase to as high as 2 billion tons of hard coal units.

In more advanced light-water reactors, a quantity of energy can be produced from the spent fuel elements which is roughly equivalent to the output of German hard coal mining up to the year 2000. This calculation--I would like to make specific reference to it--does not take into consideration the fast breeder which is even far more economical.

However, before this audience I would also like to refer to the effects of industrial policy. Reprocessing spent fuel elements is the pivotal issue for German nuclear chemistry and thus for a number of new industries. These industries are characterized by:

--high technical knowledge,

--low requirements for raw materials and energy,

--high capital requirements.

The construction of reprocessing plants itself provides primary impulses for a large number of industrial branches, ranging from machine construction to robot technology to special services. In addition, there are secondary impulses. Like coal in its day, the materials which are obtained with the help of reprocessing comprise the foundation for additional large and small enterprises, in particular also for middle-level industry. Thus, for example, in the radioactive fission product solutions, which we still today call radioactive wastes, there are a number of radionuclides for which there is now a market, for example, in medicine and technology. In France, for example, cesium is separated from our fuel elements which are sent to France and is distributed on the world market as a ray source for technical applications.

This is only one example! Politically conditioned technological abstinence in this sector would isolate the FRG in the circle of other important industrial countries. It would then no longer be possible to establish independent German nuclear chemistry.

What Can Be Done?

In view of the situation described in respect to the requirements and satisfying them, but also in view of the well-known situation in respect to a political decision, the question for state and industry is: What has to happen in order to guarantee for the year 2000 the disposal of waste from German nuclear power plants. To begin with, I would like to establish that we--the industry--naturally accept the demand imposed by state and policy to give priority to the safety of our people. This priority interest in safety, however, needs to be carefully weighed against other safety interests of equal value.

Postponement of the political decision about the direction to be taken in the future in respect to waste disposal must be accepted by us--the industry--as a fact. This postponement was caused by the 16 May 1979 decision of the land government heads. Based on the 29 September 1979 resolutions of the government heads it is necessary from the point of view of the industry to decide on further action. Thus, the following set of suggestions:

1. Intermediate storage capacities for spent fuel elements inside and outside nuclear power plants must be made available; this is already in progress and promises to be successful.

2. The reprocessing plant in Karlsruhe is the cornerstone of German nuclear chemistry. This must be put back into operation as soon as possible and kept in operation until a second German reprocessing plant can start operating.

3. Planning, construction and operation of the reprocessing plant in Hessia is unconditionally necessary in order to maintain and further develop reprocessing technology. Independent of the fundamental decision which according to the resolutions of the government heads will not be made until the middle of this decade the plant in Hessia must be planned in such a way that construction can be started in 1984. Under these conditions this plant could make its contribution to satisfying waste-disposal requirements starting in 1993.

4. Parallel with the planning for reprocessing plants, the technology of direct final storage must be purposefully further developed so that following a fundamental political decision in favor of this waste-disposal technology, planning and construction of the necessary plants can be started without delay.

5. Parallel with the planning and the licensing procedure for the plant in Hessia, the possibility of implementing a licensing procedure for an additional 350-ton uranium reprocessing plant in another land should be examined without delay. The effect of this would be that following a political decision on basic principles in favor of reprocessing, construction of another 350-ton uranium plant at another site can be started without delay. Thus, approximately in the middle of the next decade there would be a total reprocessing capacity of about 700 tons of uranium per annum. Moreover, it would be possible to distribute over two plants the disproportinately high planning costs for the reprocessing plant in Hessia (approximately DM1 billion).

6. Directly after a fundamental political decision in favor of reprocessing is made, planning would have to be started for a larger reprocessing plant--700 tons of uranium per annum, and 1 to 2 years after that the licensing procedure would have to be initiated. This plant could start operation toward the end of the 1990's. For this larger plant, a decision could be made at a given time whether this plant should be built at the site of the first or second 350-ton uranium plant or at a third site yet to be made available. In this way in the year 2000 we could have a total reprocessing capacity of 1,400 tons of uranium per annum.

Science, technology and industry in the FRG are in a position to build and are prepared to build the necessary plants for removing waste from nuclear power plants and thus to solve the waste-disposal problem. But we need reliable basic conditions and clear political decisions. Our plea is directed at being concerned that the political decision facing us be made as soon as possible and in time.

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CSO: 5100

RESEARCH CENTER WORKS ON FAST BREEDER, OTHER AREAS

Bonn DIE WELT in German 8 Oct 80 supplement p 1

[Article by Frank Gehrling: "Fast Breeder Is Still Number One"]

[Text] Its name and its program are the same: In line with the new task and financial plan, the Nuclear Research Center, Karlsruhe, will spend a total of DM 335 million for research and development work from now until 1983. An additional DM 80 million is required for operating the center's comprehensive and very expensive equipment, such as large computers, reactors, accelerators and test facilities.

Project Fast Breeder, which accounts for about one-third of the total operating expense, continues to be in the foreground of all work. It is followed in importance by projects related to reprocessing, waste handling and nuclear safety.

About two-thirds of the research and dvelopment potential is associated with project-oriented work. This is work to be carried out under agreement with or in collaboration with both national and international research institutions and industrial partners or with official agencies in the authorization and safety fields. It constitutes a very significant part of the research and development work load.

Situated on a tract of about 2 square kilometers approximately 12 kilometers north of town is the Nuclear Research Center, Karlsruhe, which is operated by the Nuclear Research Center Karlsruhe GmbH (KfK GmbH). The center was founded in 1956 as the first of its kind in the FRG and today is certainly among the greatest German research institutions. The Federal Government and the Land hold the stock: government 90 and Land 10 percent.

What work is to be performed in the nuclear research center in the period just ahead can be read from the task and financial projection till 1983. While, for example, in the development of the fast breeder in collaboration with France, which is now building the Super Phoenix after putting the Phoenix into successful operation, a cost reduction will be possible, expenditures for fusion technology on the other hand show an increasing trend.

It goes without saying the the Nuclear Research Center, Karlsruhe, tracks with due diligence the world's nuclear research and development in general, but it focuses in particular on the operation of nuclear reactors. Thus it is altogether natural that in the work on safety of light-water reactors several leads from the Harrisburg

accident have been picked up and included in the program. The goal is early detection and positive control of such breakdowns.

Worthy of mention under nonnuclear engineering development work, which makes up about a quarter of the annual budget, are basic research, innovation, low-temperature technology and data processing.

Also worth mentioning are institutions which have on-site activities at the center but which do not belong to the center. These are the European Institute for Transuranium, the Technical Information Center for Energy, Physics and Mathematics and the Institute for Radiation Technology of the National Research Institute for Nutrition.

About 5,000 people are employed at the research center. However, if products and services provided by firms in Baden-Wuerttemberg and outside the state are considered, one can say that the center provides sustenance for 20,000 people. This is expecially evident when one considers the DM 5.2 billion disbursed by the center from 1956 until 1977.

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CSO: 5100

SOVIET EXPERT DENIES SERIOUSNESS OF LOVIISA PROBLEMS

Helsinki HELSINGIN SANOMAT in Finnish 2 Oct 80 p 3

[Article by Pentti Suominen: "Soviet Nuclear Power Industry Expert: 'Loviisa Power Plant Defects Will Not Be Repeated'"]

[Text] Volgodonsk—In Soviet nuclear power plants, there are no longer any defects of the kind that caused months of shutdown in the Finnish Loviisa-1 plant and delayed utilization of the Loviisa-2 plant for years.

This is what Soviet nuclear power industry expert, Soviet deputy minister of power machine building and general manager of the Volgodonsk Atommash Factory, engaged in the construction of nuclear power plants, Valeriy Pershin says.

"At the present time, we do not have any such problems. The plants that were exported to Finland were part of our early production and we have learned a lot since then," Pershin said.

The problems we had with the Soviet-manufactured Loviisa plants primarily had to do with welding defects observed in the pressure vessel and the heat exchanger.

Because of these defects, annual maintenance this summer on the Loviisa-1 plant took several months longer to evaluate and getting the number-two plant into operation has been delayed for years because of welding defects and delivery problems.

Neither power plant is at present in operation and it is estimated that the shutdown costs us at least 200,000 marks a day because we have to resort to more costly sources of energy.

Nor did Pershin completely reject the possibility that not all the inspection provisions in effect in the Soviet Union may have been observed with regard to the newer Loviisa-2 plant which, because of operational difficulties, has been delayed for a couple of years.

"Atommash Offers 40-Year Guarantee"

But at the same time, he hastened to assure us that the nuclear power plants that are exported to Finland are built at the Izhora Works near Leningrad and that such negligence would not be tolerated at the Atommash Factory which is under his direction.

And Pershin is ready to offer a 40-year operational guarantee on power plants produced by Atommash, despite the fact that the factory has not yet built a single plant.

"Perhaps provisions for the inspection of the technological process are violated in Leningrad, but here we do everything according to regulations," he insisted.

The fact that the X-rays of the pressure vessels which the Soviet Union sent to Finland showed no welding defects whereas the X-rays taken in Finland did reveal those defects also points to negligent observation of provisions for inspection or flaws in the system.

Pershin did not wanto to go into any more detail on defects found earlier in their own power plants, but we can imagine that they caused sizable problems.

According to Western Eruopean information, there were already 36 reactors in operation here in 1976, whose pressure vessels and heat exchangers were built before the original conveyance date for the Loviisa-2 plant pressure vessel.

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REACTOR AT LOVIISA 2 NUCLEAR PLANT LAUNCHED

LD280832 Moscow TASS in English 0810 GMT 28 Oct 80

[Text] Helsinki, 28 Oct. TASS--TASS correspondents Veito Leskinen and Nikolay Gorbunov report: The builders of the nuclear power plant near the Finnish town of Loviisa--a major project of the Soviet-Finnish cooperation--have been witness to a remarkable event--the physical launching of the reactor at the Loviisa-2 nuclear power plant.

After the trial-run of all the systems, the reactor will gradually reach the design parameters and the power plant will be included into the Finnish overall energy system.

The year 1917 marked the beginning of the peaceful use of the atomic energy in Finland. In the country's south, on the island of Hastholm, Soviet and Finnish specialists built a nuclear power plant Loviisa-1, Finland's first large nuclear power plant. During the years of its industrial exploitation, the nuclear power plant and the Soviet equipment have shown a reliable performance. Professor of Finland's State Scientific and Technological Centre Pekka Silvennoinen, a leading specialist in this field, gave a high appraisal to the level of safety of the Loviisa nuclear power plant.

The successful exploitation of the Loviisa-1 nuclear power plant enhanced our general prestige, says member of the directorate of the customer, the state stockholding society Imatran Voima, Kalveli Numminen. The plant's technical level meets high standards. Thus specialists from many countries who have visited the power plant rank the degree of its automation as one of the best in the world. During the three years, the nuclear power plant has generated over 10 billion kilowatt-hours of electric power.

Imatran Voima has strong long-standing ties of cooperation with the Soviet Union, Penti Alvaioki, the firm's general director, said in an interview with TASS correspondents. In the sixties, we built, on a Soviet order, four hydroelectric power stations in northern Karelia. But the centrepiece of our cooperation is of course the nuclear power plant in Loviisa.

The joint experience accumulated in Loviisa by Soviet and Finnish specialists, Penti Alvaioki pointed out, will be used in developing control and measuring instruments and automation equipment for nuclear power plants now under construction in the Soviet Union. Possibilities are being examined for joint ventures in third countries. Such relations accord with the mutual interests of our countries and constitute implementation of the long-term programme for the development and deepening of the trade and economic, industrial and scientific and technological cooperation between the USSR and Finland till 1990.

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IMATRAN VOIMA REFUSES COMMENT ON SOVIET'S NUCLEAR PLANT ASSURANCE

Helsinki HELSINGIN SANOMAT in Finnish 3 Oct 80 p 19

[Text] Imatran Voima (IVO) is surprised at Atommash Factory general manager and Deputy Minister of Power Machine Building Valeriy Pershin's understanding of the Loviisa power plant defects. IVO project operations chief Kalervo Nurminen did not want to comment on Pershin's views, merely saying that it would be best to comment on them internally in the Soviet Union. In his opinion, the Loviisa defects were not sensational.

Pershin's statements caused so much consternation at IVO that their sarcasm was attributed to translation errors.

According to a report in yesterday's edition of an interview with general manager Pershin by HELSINGIN SANOMAT's Moscow correspondent, provisions for the inspection of the technological process may have been violated at the Izhora Nuclear Power Plant Works located near Leningrad. The fact that the X-rays of the pressure vessels which the Soviet Union sent to Finland showed no welding defects whereas those taken in Finland did reveal those defects also points to negligent observation of provisions for inspection or flaws in the system.

The problems the Loviisa plants had involved defects observed in the pressure vessels and heat exchangers. Because of delivery problems, the opening of the Loviisa-2 plant has been delayed for years.

The Atommash Factory, headed by general manager Pershin, is right now getting ready for Volgodonsk. Atommash is also far behind schedule.

Nuclear Power Plants Don't Come Off Assembly Line

According to Nurmimaki [as published], Pershin gave a peculiar picture of the construction of nuclear power plants. "In the Soviet Union, they are not turned out on an assembly line," Nurmimaki said. The Atomenergoexport foreign trade company sold Finland the Loviisa power plants and 50 different Soviet factories were active in building them. The Izhora Works manufactured detached components. Among others, reactor regulators, heat exchanger collectors and main cut-off valves are made in other factories.

Nurmimaki is leaving the settling of the dispute over the Soviet nuclear factories to an internal tug of war, but he said: "I guess sometimes anything can produce a breakdown."

During the interview, Pershin said that the Loviisa plants were part of the early production, but since then they have learned a lot about building nuclear power plants in the Soviet Union. According to Nurmimaki, the Izhora Works has manufactured about 20 pressure vessels and the Loviisa vessels were not part of any especially early production.

French Power Plant Study Set in Motion

This month, IVO is to begin a feasibility study with the French company, SOFRATOME [expansion unknown]. The joint study involves IVO's next big power plant, which is supposed to be built by the end of this decade.

As far as IVO is concerned, the implementation of this feasibility study does not mean that IVO is ordering the nuclear power plant. IVO has been involved with the Soviet Atomenergoexport in a considerably far-advanced feasibility study, but the French joined the competition as a result of the French president's visit last summer.

IVO also intends to enter into an agreement with the Soviet Union before the end of the year on the planning of a 1,000-Mw power plant. According to information director Klaus Raninen, this does not mean that IVO will order a power plant from them either, "but that we will begin to plan for it and pave the way for the factors involved in a decision."

IVO hopes to come to a decision on the next power plant sometime in 1982. In terms of IVO's energy needs schedule, however, the decision may be delayed by a year or two.

If the next big power plant is to produce electricity from nuclear energy, construction costs are estimated at from 3.5 to 4.5 billion marks. The completion of feasibility studies alone will cost tens of millions of marks.

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BRIEFS

LOVIISA-2 LICENSING DELAYED AGAIN—Loviisa (HS)—The launching of operations at Loviisa's second power plant will be further delayed. This time defects have been found in the electric motors of the main circulation pumps. Loviisa-2 has not yet managed to get into operation, even though the Radiation Security Institute had already given permission to go into operation at the rate of 2 percent of capacity a week ago. The water for processing had been heated in preparation for going into operation. Now it will have to be cooled. Loviisa-2's sprinkler-system pumps have also been repaired. Repair work is still in progress. However, it must be completed before the plant can go into operation. Getting Loviisa-2 into operation has been dragging on for two and a half years beyond the original deadline. One defect after another has been discovered in the plant. For the present, officials do not know exactly how long it will take to clear up the difficulties that have recently turned up. The matter may be cleared up by the beginning of next week. [Text] [Helsinki HELSINGIN SANOMAT in Finnish 11 Oct 80 p 3] 11466

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PELLERIN NUCLEAR POWERPLANT SITE APPEARS CERTAIN

Paris LE FIGARO in French 8 Sep 80 p 7

[Article: "Nuclear Affairs: the Pellerin Site Definitively Decided On?"]

[Text] Has the choice of the Pellerin site, 25 km from Nantes, on the banks of the Loire River, been definitively decided on by the Ministry of Industry for the construction of a new nuclear energy generating station? The rumor has been making the rounds for the past few days in trade union circles in Nantes, and last Thursday [4 September] Edmond Maire added a few unexpected words to his speech at the beginning of the fall season in Nantes to attack the project and to recall the opposition of the CFDT to the intentions of EDF.

The rumor was strengthened this weekend by professors at the College de France, according to whom the construction activity could begin at Pellerin in 2 or 3 weeks. The ministry has been precise in speaking of the matter in June, stating that no official decision would be made before the beginning of 1981 and that the Pellerin site was not on the list of 16 projects announced for 1981.

This project, which would make Pellerin into one of the most important nuclear energy generators in the French network (5,200 MgW in three stages of 1,300 MgW) [sic], will have been one of the most controversial to be constructed during the three years of public hearings on the matter. This public hearing was in a certain sense the dress rehearsal for the recent events at Plogoff: campaign to collect signatures; a march of 3,000 anti-nuclear demonstraters, with tractors, to Nantes; destruction of land records; opposition of the Mayor of Nantes, Alain Chenard, who protested "against the risks for the whole population of Nantes, consisting of 500,000 people" and who rejected construction of a nuclear power station less than 50 km from the city (it is known that since the Three Mile Island incident the USA has required that any nuclear generating station must be a minimum of 15 km from an urban center.). The nuclear energy security services had themselves expressed some doubts about the appropriateness of the site.

This project, however, appears justified by the fact that, whereas France as a whole imports 75 percent of its energy needs, the Loire Valley area (with all of Brittany totally dependent on imported energy) for its part must at present bring in 98 percent of its energy from abroad.

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BRIEFS

IODINE TABLETS APPROVED--Stockholm, 24 Oct--On Thursday the government gave the National Social Welfare Board and the National Institute of Radiation Protection the task of preparing the manufacture and distribution of iodine tablets to people who live 10 - 20 km from our nuclear power stations. At the same time the National Fire Service Board was given the task of developing recommendations for education and training of personnel of the county administrative boards and some of the central emergency preparedness organizations. The recommendations will be submitted before the end of the year. [Text] [Stockholm DAGENS NYHETER in Swedish 24 Oct 80 p 7] 9287

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24 Nov. 1980

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